



# The Caribbean Regional Association for Ocean Observing (CaRA)

## Executive Director Update

Julio M. Morell



# Background

## CaRA achievements

Initial CaRA development project (2004-2007)

*“Proposal to the Coastal Services Center to Establish CaRA, the Caribbean Regional Association in Support of an Integrated Ocean and Coastal Observing System for the U.S. Caribbean Exclusive Economic Zone”*

- Establishment of CaRA offices (UPRM and UVI)
- Identification of existing coastal marine data streams
- CaRA and CarICOOS web pages
- Regional needs assessment
  - Canvassing PR Sea Grant and CIEL
  - Sector focused workshops, presentations, meetings
- Pilot projects implemented (NWS, NERRS)
- Expert visitors program
- Regional Association and Council established in Dec 07 (representative constituency and governing body)

# Background

## CaRA Structure

- Organizational structure
  - Memorandum Of Agreement  
(signed on Dec 4, 2007)
- Membership:
  - 57 signatories
- Affiliations
  - Academics 18%
  - Government agencies 12%
  - Private Sector 40%
  - Federal Agencies 9%
  - Self Signatories 21%

## Stakeholders Council

- 13 Council Members
  - 1 Council Chairman
  - 1 Council Secretary
  - Executive Committee (4 council members)
  - Membership and Nominations Committee
  - 4 additional committees to be empanelled:
    - » Education & outreach
    - » DMAC
    - » Observing systems
    - » Products and Services

# Current activities

CaRA development project (2008-2010):

*“SUPPORT TO THE CARIBBEAN REGIONAL ASSOCIATION FOR INTEGRATED COASTAL OCEAN OBSERVING”*

- Enhancing proactive participation and diversity within the Governance Structure
- Continued revision and refinement of CaRA’s draft development plan by the Stakeholder Council and Executive Committee, consultants and legal counselor.
- Continued and expanded exchange with stakeholders to provide for further development of CaRA’s initial needs assessment
- Continued refinement and prioritization of CaRA’s observing system design.
- Development and reformatting of CaRA’s website to conform to a common identity with other IOOS components
- Enhancement of stakeholder recognition and trust through development of useful data products

# Current activities (continued)

## CaRA development project (2008-2010):

- Re-engaged and recruited CaRA interns and IT technician
- Support and participation in “Caribbean Training Course for Operators of Sea Level Stations (IOC-GLOSS-PRSN)”
- Participation in IOOS related meetings and workshops
- Publication of articles and interviews
- Hosted expert partner visits (WeatherFlow, CoastWatch)
- CSO-CaRA Workshop at San Juan, Puerto Rico. Workshop on Ocean Observing in Support of Coastal Management
- Participation in the USCG Harbor Safety and Security Committee meetings
- Funded VI WeatherFlow initiative and supplemented VI ROMS effort
- Leveraging funding:
  - DHS (\$50k/y 5y)
  - DRNA (\$145k)
  - UPRM (\$10k)

# CarlCOOS development project (2008-2010)

*“Implementation of the Caribbean Regional Integrated Coastal Ocean Observing System” (NOAA IOOS sponsored)*

## Project Goals:

- Emplace and maintain coastal observing assets to provide near real time “in situ” observations of coastal circulation, waves, winds and water quality in Atlantic and Caribbean coastal zonal bands.
- Implement an operational modeling program that will generate coastal wind, wave and circulation forecasts while providing an integrative regional context to observational data from core coastal observing assets. The proposed modeling program will also generate improved storm surge driven coastal inundation maps.
- Develop observational capacity and tools to monitor water quality in the region.
- Assure data usefulness to all stakeholder sectors by following tailored product design and delivery strategies and implementing DMAC/procedures.

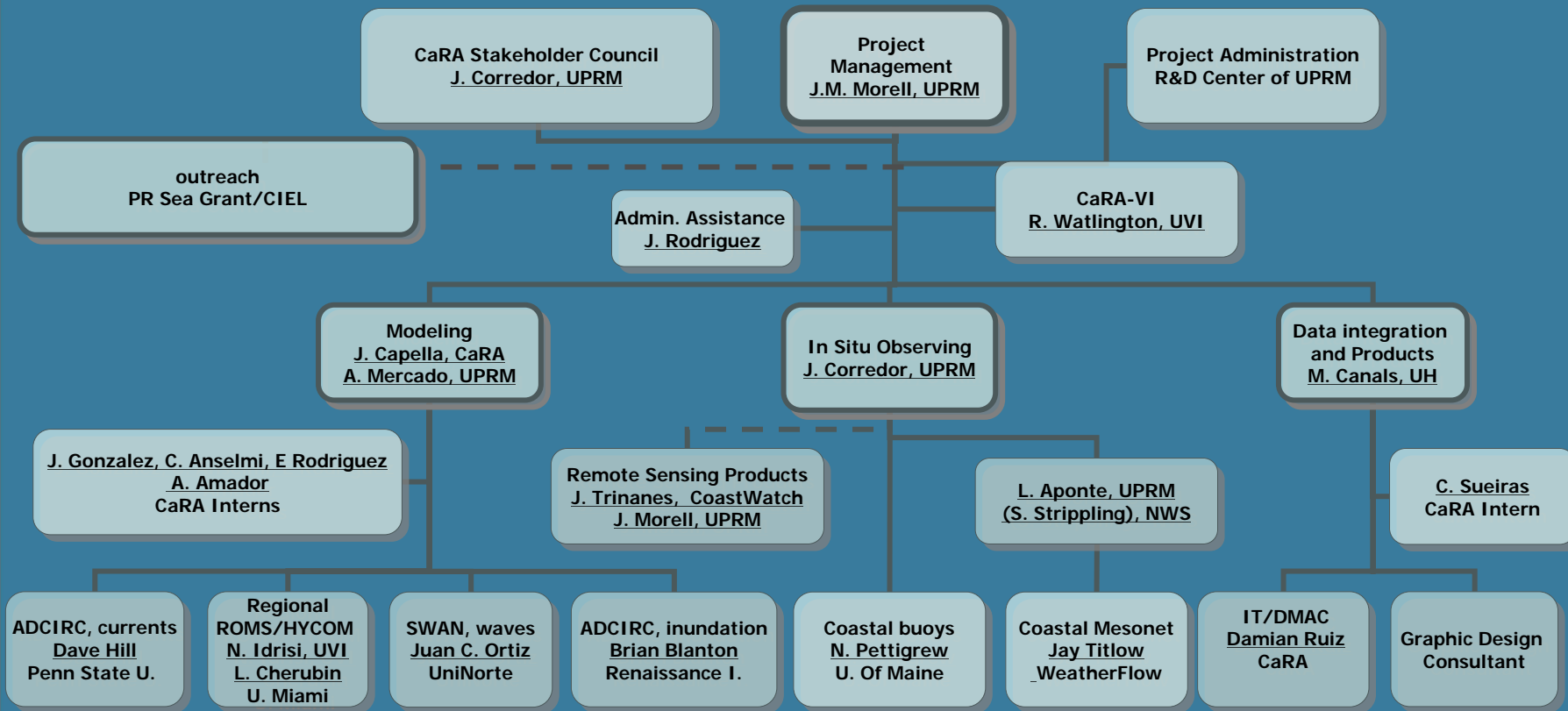
# CarlCOOS development project (2008-2010)

## Major Elements:

- Deploy operate and maintain 2 custom designed GOMOOS type data buoys in Atlantic and Caribbean coastal zonal bands in collaboration with U. Maine
- Install 5 hurricane hardened coastal weather stations and upgrade 7 existing weather stations in collaboration with WeatherFlow Inc.
- Implement SWAN (Simulating Waves Nearshore) model in three nested computational grids: coarse (1.25 by 1.0 degree), intermediate (ca. 1.8 km) and fine (35-50 m resolution) for selected nearshore areas
- Implement ADCIRC Coastal Circulation and Storm Surge Model for the region
- Develop remotely sensed data products and applications in collaboration with NOAA CoastWatch

# Significant Accomplishments

CaRA-CarICOOS organizational structure established



INTEGRATED OCEAN OBSERVING SYSTEM





# Significant Accomplishments

- All contracts with partner institutions are in place and most equipment acquisitions have been completed
- Personnel working on the project, particularly in the numerical modeling component, are fully engaged and currently undergoing hands-on training with partner experts
- Formal contract established with PR DNRE for application of ADCIRC model in delineation of storm surge coastline limits parallel application.
- Sub-award from Stevens Institute of Technology for DHS-funded Center for Secure and Resilient Ports (CSR)
- Collaboration under way with Rutgers COOL for proof-of-concept deployment of “dual-use” CODAR HF radar
- New CarICOOS data portal <http://caricoos.org/drupal>



- Ocean Data**
- Wind
  - Waves
    - Observations
      - Eastern Caribbean
      - South Western Atlantic
      - St. Croix, Virgin Islands
    - Forecasts
      - Local
        - NWS Graphical Forecast
        - WWII Model Waves
      - Regional
        - WWII Western North Atlantic
  - Currents
  - Amosias
  - Ocean Color
  - Sea Surface Height
  - Sea Surface Salinity
  - Sea Surface Temperature
  - Tides
  - CoastWatch Caribbean and Gulf of Mexico
  - Related Links

- Marine Weather Forecasts**
- Nearcoastal
  - Offshore

- Experimental Models**
- Winds - WRF

- Caribbean Time Series**
- The Caribbean Time Series Program
  - CaTS Data



**User login**

Username: \*

Password: \*

- Create new account
- Request new password

**Waves**

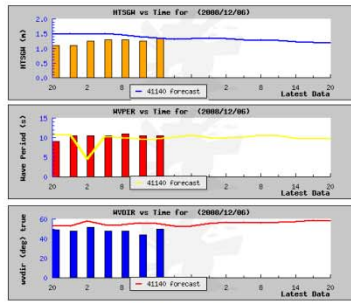
Ocean waves for the most part are produced by the wind although several other types of waves exist. Wave height and direction is measured aboard ocean buoys. Several mathematical models exist that allow extrapolating regionally using the data buoy input and knowledge of winds and other forcing. The imagery here presented originates from these models. The NWS models here presented are only for offshore ocean waves. When waves "feel" the bottom their nature changes and these models are incapable of reproducing such changes. CarICOOS is currently implementing other models that can reproduce nearshore waves. These will be available in the near future. "Wavestreams" is a data visualization product developed for CaRA/CarICOOS. Click on individual "waves" to access near-real time data and model forecasts. Graphs provide a time-based record of observed wave height (in meters), wave period (in seconds) and wave direction (in degrees). Scroll down to see graphs.

Buoys:

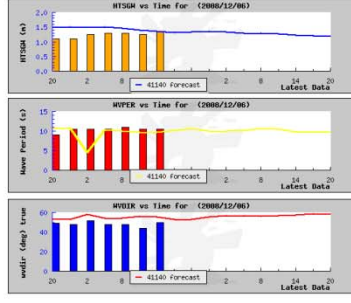


Denotes a marker outside of current map scope. Click to follow this marker.

**10 minutes Resolution**



**4 minutes Resolution**



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# Significant Accomplishments

Partnering with outside the region experts has been extremely effective for technology transfer and training of CaRA interns

## EXPERTS

- J. Trinanes  
NOAA CoastWatch
- J.C. Ortiz  
UniNorte, Colombia
- B. Blanton  
Renaissance Institute
- D. Hill  
Penn State
- N. Pettigrew  
U Maine

## INTERNS

- J. Gonzalez
- C. Anselmi
- E. Rodriguez
- A Amador
- C. Sueiras

## IT

- Damian Ruiz



Questions ?

